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Characteristics and Service Utilization of Homeless Veterans Entering VA Substance Use Treatment

Koriann B. Cox and Carol A. Malte
Veterans Affairs Puget Sound Health Care System, Seattle, Washington

Andrew J. Saxon
Veterans Affairs Puget Sound Health Care System, Seattle, Washington, and University of Washington

This article compares characteristics and health care utilization patterns of homeless veterans entering substance use disorder (SUD) treatment. Baseline self-report and medical record data were collected from 181 homeless veterans participating in a randomized trial of SUD/housing case management. Veterans, categorized as newly ($n = 45$), episodically ($n = 61$), or chronically homeless ($n = 75$), were compared on clinical characteristics and health care utilization in the year prior to baseline. Between-groups differences were seen in stimulant use, bipolar, and depressive disorders. A significant majority accessed VA emergency department services, and nearly half accessed inpatient services, with more utilization among chronically versus newly homeless. A majority in all groups attended VA primary care (73.5%) and mental health (56.9%) visits, and 26.7% newly, 32.8% episodically, and 56.0% chronically homeless veterans initiated multiple SUD treatment episodes ($p = .002$). A significant proportion of veterans struggling with homelessness and SUDs appear to remain unstable despite high utilization of VA acute and preventative services.

Keywords: homelessness, veterans, health care utilization, alcohol/drug use disorders

Homeless veterans have high rates of infectious disease, serious mental illness, and substance use disorders (SUDs) and utilize more acute services, including inpatient medical, surgical and psychiatric services, and emergency department (ED) care, relative to housed veterans. (Gabrielian, Yuan, Andersen, Rubenstein, & Gelberg, 2014; LePage, Bradshaw, Cipher, Crawford, & Hoosyhar, 2014; Tsai, Doran, & Rosenheck, 2013). Nevertheless, homeless veterans receive fewer preventative services (McGuire & Rosenheck, 2005) and underuse primary care (Gabrielian et al., 2014) relative to housed veterans with similar comorbidities.

Koriann B. Cox and Carol A. Malte, Center of Excellence in Substance Abuse Treatment and Education, and Health Services Research and Development (HSR&D), Seattle Center of Innovation for Veteran-Centered and Value-Driven Care, Veterans Affairs Puget Sound Health Care System, Seattle, Washington; Andrew J. Saxon, Center of Excellence in Substance Abuse Treatment and Education, and Health Services Research and Development (HSR&D), Seattle Center of Innovation for Veteran-Centered and Value-Driven Care, Veterans Affairs Puget Sound Health Care System, and Department of Psychiatry and Behavioral Sciences, University of Washington.

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Correspondence concerning this article should be addressed to Carol A. Malte, Center of Excellence in Substance Abuse Treatment and Education, Veterans Affairs Puget Sound Health Care System, 1660 South Columbian Way, S-116 ATC. Seattle, WA 98108. E-mail: Carol.Malte@va.gov

Homelessness and SUDs are highly intertwined. A meta-analysis of 29 studies from seven Western countries comprising 5,684 homeless individuals found that alcohol dependence (8.1% to 58.5%) and drug dependence (2.8% to 42.3%) were the most prevalent psychiatric disorders among the homeless (Fazel, Khosla, Doll, & Geddes, 2008). Further, SUDs are one of the most significant risk factors for homelessness (Greenberg & Rosenheck, 2010; Caton et al., 2005; Tsai & Rosenheck, 2015), and are associated with extensive homelessness histories (Grinman et al., 2010; Tsai, Kasprow, & Rosenheck, 2014), decreased mental health quality of life (Grinman et al., 2010; Kertesz et al., 2005), and increased mortality (Baggett et al., 2015; Beijer, Andreasson, Agren, & Fugelstad, 2011) among homeless individuals. Further complicating matters, nearly half (45.7%) of veterans with chronic homelessness report having both SUD and mental health conditions (National Survey of Homeless Veterans, 2013).

Not surprisingly, substance use treatment outcomes appear to be adversely affected by homelessness. Homelessness has been identified as a barrier to long-term SUD treatment engagement among patients with frequent hospitalizations (Raven et al., 2010). Homeless veterans in substance use treatment showed less improvement in drug problems over the course of treatment than did veterans who were consistently housed during treatment (Buchholz et al., 2010). Further, research suggests that SUDs play an important role in driving use of costly acute services by homeless individuals. (Adams, Rosenheck, Gee, Seibyl, & Kushel, 2007; Ku, Scott, Kertesz, & Pitts, 2010). Homeless veterans in SUD treatment had more inpatient admissions and ED visits and higher total treatment costs than did veterans consistently housed during treatment (Buchholz et al., 2010).

In order to better understand utilization patterns of both acute and preventative/treatment services among homeless veterans with SUDs, we examined prior year health care utilization by homeless

veterans entering VA SUD treatment who participated in a randomized trial of intensive addiction/housing case management. Because factors associated with utilization vary considerably by persistence of homelessness (Kuhn & Culhane, 1998), we grouped veterans into three categories: newly homeless, episodically homeless, and chronically homeless. Groups were then compared to: (a) describe the demographics and clinical characteristics of this population; and (b) examine differences in utilization of acute (inpatient, ED) and preventive/treatment (primary care, specialty medicine, mental health, SUD) services.

Method

Participants and Procedures

This study utilized baseline data from 181 veterans participating in a randomized trial of intensive addiction/housing case management at the VA Puget Sound, Seattle Division. Veterans were eligible to participate in this trial if they were currently homeless, had initiated a new episode of SUD care in the VA Puget Sound Addiction Treatment Clinic within the last 30 days, and intended to reside in the Seattle-area for at least 1 year. Homelessness was defined as sleeping outside or in a car, staying in emergency shelter or with family/friends without paying rent (couch-surfing) for one or more days at baseline. The study was approved by the VA Puget Sound institutional review board (ClinicalTrials.gov Identifier: NCT01346514). Written informed consent was obtained from all participants.

Measures

Demographic, SUD, non-VA service utilization, and housing history data were obtained through participant interview at baseline. Demographic and SUD data were collected using the Addiction Severity Index (ASI), which has demonstrated validity and reliability in a variety of settings (Hodgins & el-Guebaly, 1992; McLellan et al., 1992). The ASI defines seven domains (medical, employment, alcohol, drugs, family/social, legal, and psychiatric) in which individuals with substance use disorders typically have problems. Composite scores based on data reported about the 30 days prior to the interview indicate the seriousness of problems in each domain and have been shown to be sensitive to changes in severity of those problems over time.

Non-VA service utilization included outpatient medical and mental health, inpatient, and community housing service use in the 90 days prior to baseline. Housing history data included the number of past episodes of homelessness and length of the current episode.

Baseline clinical characteristics and utilization data for the year prior to baseline were obtained from the VA Corporate Data Warehouse, a national data repository that includes patient-level data on VA service utilization. Clinical characteristics included documented mental health (bipolar, psychotic, depressive, anxiety, and posttraumatic stress disorders) and alcohol and drug use disorders (excludes tobacco) based on International Classification of Diseases, Ninth Revision Clinical Modification codes (ICD-9-CM) from the electronic medical record. Participants' mental health comorbidity was determined by totaling mental health diagnoses and categorizing them as follows: 0, 1, ≥2.

Medical comorbidity was measured by a modified version of the Charlson Comorbidity Index (CCI; Quan et al., 2005), which is associated with 1-year mortality (Charlson, Pompei, Ales, & MacKenzie, 1987). CCI scores are based on the presence of 17 health conditions, weighted to reflect severity, with higher scores reflecting greater severity. For example, individuals with an ICD-9-CM diagnosis of diabetes without chronic complications receive a score of 1, whereas those with diabetes with chronic complications receive a score of 2. Participants were categorized in three CCI groups: 0, 1, ≥ 2.

VA outpatient and inpatient utilization data were classified by service type, as determined by inpatient specialty codes (inpatient medical/surgical, psychiatry/SUD, residential) and outpatient clinic codes (emergency department, mental health, homeless services, primary care, medical/surgical specialty). Prior VA SUD specialty treatment in past year (i.e., ≥1 episode prior to the current episode that qualified them for study participation) was determined by outpatient clinic stop codes. SUD care delivered in other clinics (e.g., mental health, primary care) was not included.

Homelessness Categories

Based on the work of Kuhn and Culhane (1998), self-reported past episodes of homelessness and length of current episode at baseline were used to classify veterans into one of three categories of homelessness. Veterans were newly homeless if they had experienced one episode of homelessness lasting six months or less in the last 3 years (n = 45, 24.9%). Veterans were considered episodically homeless if they had one episode of homelessness lasting between 6–12 months or two to three episodes of homelessness lasting 12 months or less in the last 3 years (n = 61, 33.7%). Veterans were considered chronically homeless if they had one to three episodes of homelessness lasting 1 year or more or four or more episodes of homelessness in the last 3 years (n = 75, 41.4%).

Analyses

Demographic and diagnostic data were compared by homeless group using chi square or linear regression, for categorical and continuous data respectively. Ordinal data (mental health diagnosis count, CCI score categories) were analyzed using ordinal logistic regression. Number of outpatient visits and inpatient days were compared using negative binomial regression, with age, count of mental health diagnoses, CCI score, and alcohol/drug diagnoses (alcohol only, drug only, or both) included as covariates. Logistic models that included the same covariates as above compared groups on the likelihood of multiple SUD treatment episodes.

Results

Of 181 veterans enrolled, 177 were male (97.8%); 108 Caucasian (59.7%); 113 divorced or separated (62.4%); 29 service connected at 50% or higher (16.1%); and 158 reported no days worked in the 30 days prior to baseline (87.3%). The mean age was 50.9 (SD = 9.5), and years of education was 13.1 (SD = 2.0).

Patient Characteristics by Homelessness Group

Table 1 contains a breakdown of demographics and clinical characteristics by homelessness category. Groups differed with

respect to their living arrangements over the past 3 years. Participants in the chronically and episodically homeless groups were more likely to report having no stable arrangement relative to the newly homeless group (Odds Ration [*OR*] = 41.0, 95% CI [12.7, 132.8], $p < .001$ and *OR* = 12.1, 95% CI [3.8, 38.0], $p < .001$, respectively) and the chronically homeless was more likely to report no stable arrangement relative to the episodically homeless group (*OR* = 3.4, 95% CI [1.6, 7.3], $p = .002$).

With respect to diagnoses, no differences between homelessness groups were seen in alcohol, opioid, or cannabis use disorders. Differences were seen in stimulant use disorder, with chronically homeless more likely to be diagnosed relative to the newly homeless group (*OR* = 3.2, 95% CI [1.5, 6.9], $p = .003$). Further, both the chronically and episodically homeless were more likely to have both an alcohol and drug use disorder relative to the newly homeless group (*OR* = 3.1, 95% CI [1.4, 6.7], $p = .004$ and *OR* = 3.8, 95% CI [1.7, 8.8], $p = .001$, respectively). Differences also were detected in mood disorders, with the chronically and episodically homeless more likely to have a bipolar diagnosis (*OR* = 10.1, 95% CI [1.3, 80.1], $p = .029$ and *OR* = 9.7, 95% CI [1.2, 78.5], $p = .033$, respectively) and less likely to be diagnosed with depressive disorder (*OR* = 0.4, 95% CI [0.2, 0.9], $p = .037$ and *OR* = 0.3, 95% CI [0.1, 0.6], $p = .003$, respectively) relative to the newly homeless group. There were no significant differences between groups in anxiety, psychotic, and posttraumatic stress disorder, count of mental health diagnoses, or CCI score categories.

Table 1
Baseline Demographics and Clinical Characteristics by Homelessness Classification

Characteristics	Newly homeless ($n = 45$) *n* (%)	Episodically homeless ($n = 61$) *n* (%)	Chronically homeless ($n = 75$) *n* (%)	*p*-value
Age, *M* (*SD*)	53.0 (9.3)	50.2 (8.8)	50.2 (10.1)	.212
Female	0 (.0)	2 (3.3)	2 (2.7)	.494
Race				
White	25 (55.6)	35 (57.4)	48 (64.0)	
Black	16 (35.6)	20 (32.8)	24 (32.0)	
Other	4 (8.9)	6 (9.8)	3 (4.0)	.669
12+ years of education	28 (62.2)	38 (62.3)	37 (50.0)	.262
Service connected ≥ 50%	12 (26.7)	8 (13.1)	9 (12.0)	.079
Employed last 30 days	4 (8.9)	6 (9.8)	13 (17.3)	.288
Marital status				
Married/widowed	4 (8.9)	6 (9.8)	5 (6.7)	
Divorced/separated	35 (77.8)	35 (57.4)	43 (57.3)	
Never married	6 (13.3)	20 (32.8)	27 (36.0)	.091
Living arrangements, last 3 years				
Family/friends	21 (46.7)	13 (21.3)	11 (14.7)	
Alone	17 (37.8)	13 (21.3)	3 (4.0)	
Controlled environment	3 (6.7)	2 (3.3)	1 (1.3)	
No stable arrangement	4 (8.9)	33 (54.1)	60 (80.0)	<.001
SUD diagnoses				
Alcohol disorder	39 (86.7)	57 (93.4)	65 (86.7)	.389
Cannabis disorder	13 (28.9)	26 (42.6)	33 (44.0)	.224
Opioid disorder	7 (15.6)	9 (14.8)	18 (24.0)	.318
Stimulant disorder	18 (40.0)	36 (59.0)	51 (68.0)	.011
SUD diagnoses type				
Alcohol only	20 (44.4)	12 (19.7)	13 (17.3)	
Drug only	6 (13.3)	4 (6.6)	10 (13.3)	
Alcohol + Drug	19 (42.2)	45 (73.8)	52 (69.3)	.004
Mental health diagnoses				
Anxiety disorder	8 (17.8)	22 (36.1)	24 (32.0)	.109
Bipolar disorder	1 (2.2)	11 (18.0)	14 (18.7)	.027
Depressive disorder	36 (80.0)	31 (50.8)	46 (61.3)	.009
Posttraumatic stress disorder	16 (35.6)	25 (41.0)	29 (38.7)	.851
Psychotic disorder	9 (20.0)	10 (16.4)	13 (17.3)	.886
Mental health diagnosis count				
0	5 (11.1)	12 (19.7)	11 (14.7)	
1	16 (35.6)	17 (27.9)	24 (32.0)	
2+	24 (53.3)	32 (52.5)	40 (53.3)	.889
Charlson Index score				
0	29 (64.4)	40 (65.6)	44 (58.7)	
1	4 (8.9)	12 (19.7)	23 (30.7)	
2+	12 (26.7)	9 (14.8)	8 (10.7)	.823

Note. SUD = substance use disorder.

VA Outpatient Utilization

A majority of participants accessed VA emergency department, primary care, medical specialty/surgical, mental health and homeless services, with 132 (72.9%), 133 (73.5%), 116 (64.1%), 103 (56.9%), and 111 (61.3%) of all participants attending one or more visits in these services, respectively. Twelve (26.7%) newly homeless participants initiated multiple SUD treatment episodes in the year prior to baseline, relative to 20 (32.8%) episodically homeless participants (OR = 1.34, 95% CI [0.57, 3.14], ns) and 42 (56.0%) chronically homeless participants (OR = 3.50, 95% CI [1.56, 7.83], p = .002). VA outpatient visit counts in the year prior to baseline are presented in Table 2. The chronically homeless group had significantly greater emergency department visits per patient relative to the newly (p = .001) and episodically (p = .030) homeless groups. Greater medical specialty/surgical visits per patient were seen in the chronically (p = .001) and episodically (p = .001) homeless groups relative to the newly homeless group.

VA Inpatient Utilization

A total of 20 (44.4%), 25 (41.0%), and 36 (48.0%) participants in the newly, episodically, and chronically homeless groups, respectively, had at least one acute hospitalization (medical/surgical or psychiatric/SUD) in the year prior to baseline. Mean inpatient days by hospitalization type are displayed in Table 2. Relative to the newly homeless group, the chronically homeless group had greater acute medical/surgical (p = .009), total acute care (p = .009), and residential (p = .028) days per patient. No differences were detected in psychiatric/SUD days per patient between these groups. Further, no differences were detected between the newly and episodically homeless groups in any inpatient category.

Non-VA Utilization

No differences were detected in use of non-VA outpatient or inpatient services by homelessness group in the 90 days prior to baseline. Overall, 21 (11.6%) participants reported using non-VA emergency department services, 28 (15.3%) reported accessing non-VA housing services, and 21 (11.6%) reported a non-VA hospitalization.

Discussion

Similar to previous findings (Gabrielian et al., 2014; LePage et al., 2014; Tsai et al., 2013; Tsai & Rosenheck, 2013), homeless veterans entering SUD treatment utilized VA acute services in high numbers, with over two thirds of all study participants accessing ED services and nearly half accessing inpatient medical, psychiatric or SUD services. Chronicity of homelessness appeared to play a role in level of service use. Those veterans with longer and/or more episodes of homelessness had more ED visits and inpatient days relative to those with shorter and fewer episodes following adjustment for medical, psychiatric, and SUD severity. Such findings suggest that successfully housing newly homeless veterans may help deter overutilization of acute services in this population.

Previous work concluded that homeless veterans underutilize preventative services relative to their level of need (Gabrielian et al., 2014; McGuire & Rosenheck, 2005). Nearly three quarters of our sample had one or more primary care visits at baseline, with an average of four visits, and a majority had accessed mental health services. Further, patients in the episodically and chronically homeless group attended an average of four medical specialty visits. This high level of access may be due to introduction of the Homeless Patient Aligned Care Team (H-PACT) at VA Puget Sound during the lifetime of the study. H-PACTs seek to address the unique needs of homeless veterans and to increase their access to housing and stabilization services within primary care settings (O'Toole, Johnson, Aiello, Kane, & Pape, 2016). The fact that the chronically homeless group accessed the same or more medical and mental health visits but had significantly higher incidence of ED visits and acute inpatient days suggests that standard outpatient services may not be adequate to address their needs.

Table 2
VA Outpatient and Inpatient Service Utilization in the Year Prior to Baseline by Homelessness Classification

Service type	Newly homeless (n = 45) % M (SD)	Episodically homeless (n = 61) % M (SD)	Chronically homeless (n = 75) % M (SD)	Incidence rate ratio [95% CI][a] Episodic vs. New	Chronic vs. New	Chronic vs. Episodic
Outpatient visits						
Emergency department	2.5 (3.8)	2.7 (3.2)	4.6 (6.2)	1.40 [.88, 2.21]	2.15 [1.34, 3.43]**	1.54 [1.04, 2.27]*
Mental health	8.7 (22.1)	8.0 (22.3)	13.1 (21.3)	1.35 [.59, 3.09]	1.74 [.93, 3.26]	1.29 [.66, 2.54]
Homeless services	2.9 (8.2)	3.3 (5.9)	4.0 (6.0)	1.15 [.51, 2.60]	1.38 [.62, 3.04]	1.19 [.67, 2.14]
Primary care	4.4 (6.3)	3.5 (4.1)	4.3 (4.9)	.85 [.53, 1.37]	.98 [.63, 1.53]	1.15 [.77, 1.70]
Medical specialty/surgical	2.1 (3.6)	4.1 (6.6)	4.0 (6.3)	2.70 [1.53, 4.76]**	2.64 [1.48, 4.73]**	.98 [.63, 1.53]
Inpatient days						
Medical/surgical	1.3 (3.4)	1.7 (5.7)	2.4 (7.5)	2.50 [.86, 7.26]	5.38 [1.52, 19.06]**	2.15 [.68, 6.85]
Psychiatric/SUD	2.6 (4.2)	3.0 (6.1)	6.6 (13.1)	1.28 [.49, 3.36]	2.31 [.92, 5.79]	1.80 [.93, 3.50]
Any acute	4.0 (5.9)	4.7 (8.8)	9.0 (15.1)	1.57 [.72, 3.42]	2.62 [1.28, 5.37]**	1.67 [.93, 3.00]
Residential	11.6 (43.3)	14.8 (44.2)	26.8 (57.3)	2.67 [.60, 11.86]	5.78 [1.21, 27.74]*	2.17 [.59, 8.01]

Note. SUD = substance use disorder.
[a] Negative binomial regression adjusted for age, count of mental health diagnoses, Charlson Index score, and alcohol/drug use diagnosis (alcohol only, drug only, alcohol and drug).
* $p < .05$. ** $p < .01$.

Notably, a majority of veterans in the chronically homeless group had one or more additional VA SUD treatment episodes in the year prior to study entry, highlighting that chronically homeless veterans may recycle through SUD treatment quickly. Such findings mesh with the work on recurring, complex SUD, which is characterized by recurrent use of SUD specialty-care, recurring relapse, and comorbid mental health problems (Moss, Chen, & Yi, 2010) and suggest that the format of SUD care offered to chronically homeless veterans fails to retain them in treatment successfully.

Clinical Implications

Given that prior research has found that patients with multiple SUD treatment episodes over a 2-year period utilize more acute services than those with a single treatment episode (Hawkins, Malte, Baer, & Kivlahan, 2012), our finding that traditional SUD treatment may fall short in retaining chronically homeless veterans has important implications for clinicians and administrators. Failure to address homelessness in SUD-specialty settings may be costly on many levels. In outpatient care settings, misallocation of resources may result if homeless individuals cycle in and out of treatment with no enduring benefit. These patients may continue to utilize costly and high demand services such as inpatient SUD and mental health care at elevated rates. While additional research is needed to identify effective interventions to address homelessness in SUD settings, provider awareness of the potential impact of homeless on SUD treatment retention and increased knowledge of and coordination with available housing resources are likely important first steps.

Limitations

The limitations of this analysis include the cross-sectional design, which does not allow us to determine the impact of housing status on utilization over time. Although utilization data reflect service use at any VA facility nationally, participants were recruited from a single VA facility. Results may not generalize to homeless individuals seen at other VAs or in the community. Data on non-VA service use was limited to self-report; thus, these data do not give a complete picture of non-VA utilization.

Veterans struggling with both lack of housing and SUDs experience a high burden of disease and utilize both acute and preventive VA services at high rates. Chronicity of homelessness appears to increase use of acute services, as well the likelihood of recycling through SUD treatment. Additional research is needed to determine whether services aimed at preventing chronic homelessness have the potential to change patterns of utilization in the population. Given that a significant proportion of these veterans access VA care in multiple settings but remain unstable, interventions aimed at engagement in and coordination of care may hold promise in improving both quality of life for the veterans and burden on the health care system.

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